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Effect of cartolin on oryzalin-induced changes in lectin activity during low-temperature plant hardening

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Abstract

The effect of cartolin (0.33 μM), an antistress regulator of cytokinin type, on the cytoskeleton-dependent changes in lectin activity in the roots of unhardened (23°C) and cold-hardened (3°C, 7 days) 7-day-old plants of three cultivars of winter wheat (Triticum aestivum L.) was studied. In unhardened plants, cartolin increased activity of soluble and cell wall-bound lectins in a cultivar-specific mode. This is evidently important for subsequent enhancement of adaptation processes in the cell. The inhibitor of microtubule polymerization, oryzalin, reduced the activity of soluble lectins and increased that of cell wall-bound lectins. A reduced sensitivity of lectin activity to oryzalin after cartolin treatment could result from its stabilizing action on the cytoskeletal structures and on the interaction between cell-wall lectins and microtubules. The most efficient cartolin action, the suppression of oryzalin effect on lectin activity in hardened plants, was observed in the frost-sensitive wheat cultivar. It is likely that cartolin treatment is more efficient in the activation of adaptation processes occurring with the involvement of cytoskeletal structures in the cultivars of lower tolerance. © 2008 MAIK Nauka.

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Keywords

Cartolin, Cytoskeleton, Lectins, Low-temperature hardening, Triticum aestivum